Maryland
Department of
the Environment

Maryland Clean Air
2018 Progress Report

The air today is much different from the air of 20 years ago. After many years of federal and state regulations on vehicles, consumer products, power plants and other sources, Maryland's air quality has dramatically improved. 2017 saw a continuation of this clean air trend. New opportunities for reductions have emerged as well, including ways to mitigate the impacts of transported air pollution on Maryland and the continuing need to support federal and regional policies that enable clean air progress. This report presents clean air highlights from 2017.

Ozone

Ground-level ozone, the main ingredient in urban and regional smog, continues to be a pollutant of concern to Maryland and throughout the country. Common air pollutants, including Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO_x) are released from many sources, including vehicle exhaust, industrial processes, electricity generation, as well as smaller sources like consumer products, paints and aerosol products. Unlike many other pollutants, ozone is not directly emitted into the air from a specific source. Instead, ozone is formed when these pollutants combine in the presence of sunlight and warm temperatures. Unhealthy ozone concentrations typically occur between May and September. These months are referred to as the ozone season.

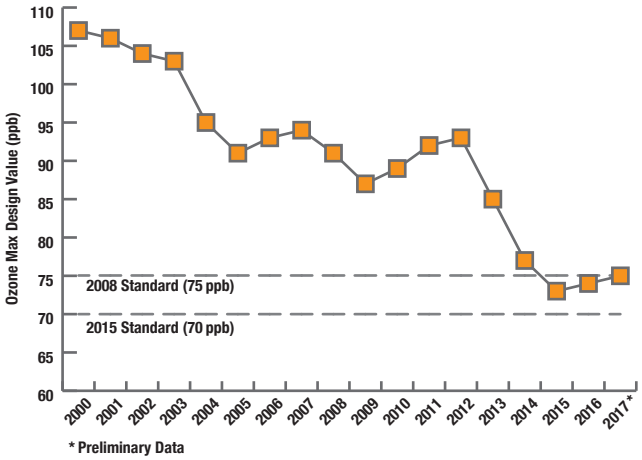
Maryland has overcome many challenges to protect public health and the environment from the effects of ground level ozone. Historically, Maryland ozone episodes have been regional and consistent. Essentially, yesterday's ozone would persist into the next day, resulting in another exceedance day. As recently as 2012, the problem was so great that the U.S. Environmental Protection Agency (EPA) characterized Maryland as having the worst air quality east of the Mississippi. As regional ozone concentrations have been reduced, widespread multi-day ozone episodes are fewer, sporadic and briefer.

During the 2017 ozone season, there were 12 days on which ozone concentrations exceeded the federal health-based standard. These concentrations were observed at monitors used to calculate Maryland's attainment with the standard. The last several years have seen historically low ozone concentrations. Temperatures in the 2017 ozone seasons were higher than observed during the 2013 through 2015 ozone seasons. Despite the warmer weather, 2017 had the second lowest number of bad ozone

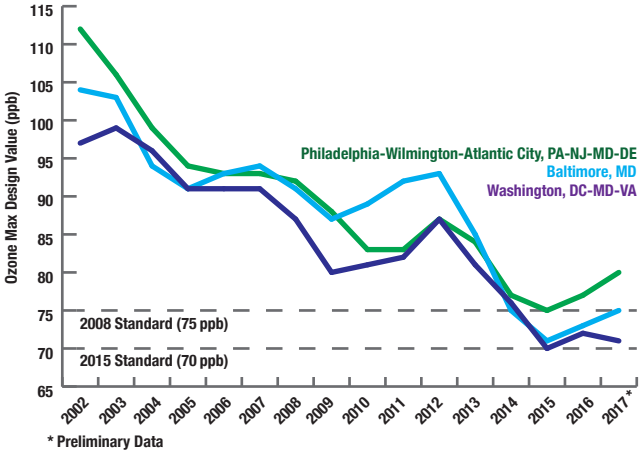
days on record.

The following tables illustrate progress that has been made in reducing ozone in Maryland and regionally. A design value is a statistic that describes the air quality status of a given location relative to the standard. A nonattainment area is an area designated by EPA as not meeting the standard.

Ozone - Statewide



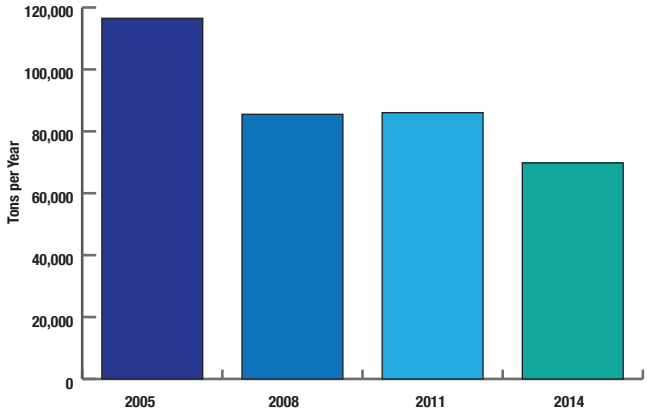
Ozone by Nonattainment Area



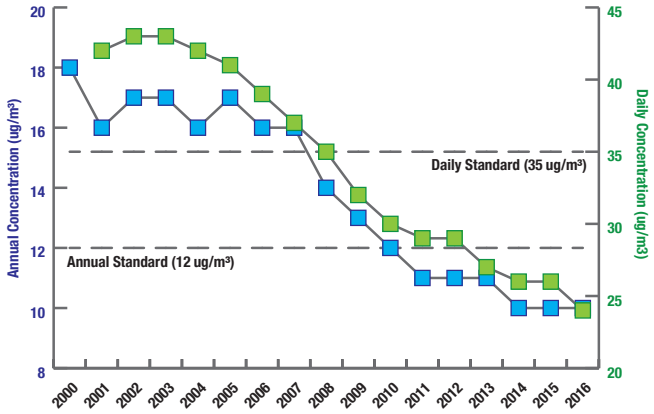
Reductions in the number and intensity of ozone episodes have been driven by the successful implementation of policies to reduce NO_x emissions. NO_x is a key component in the formation of ozone. NO_x enters the air largely through the combustion of fossil fuels by power plants, industrial sources and motor vehicles.

Emissions from mobile sources continue to be the largest source of NO_x pollution in Maryland, though significant reductions are being achieved through cleaner cars and fuels. Lower tailpipe emissions and improvements in fuel efficiency, cleaner fuels and diesel engines, and working with the private sector to lower emissions at ports and airports have greatly reduced NO_x emissions from mobile sources.

NO_x from Mobile Sources

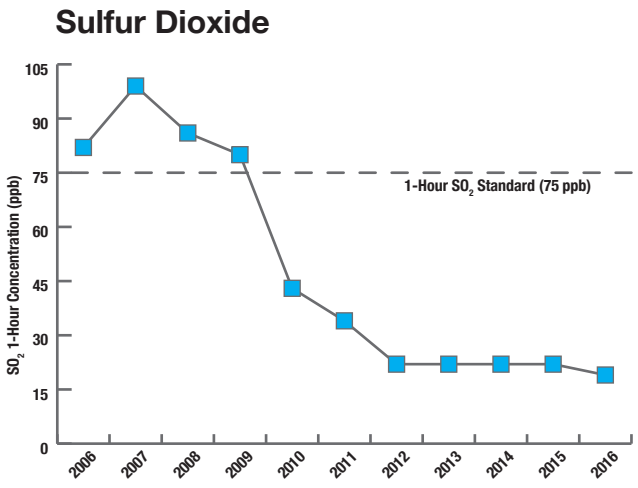


Particles



PARTICLES

Maryland's levels of fine particles are now well below the daily and annual standards for this high risk air pollutant. As recently as 2012, Maryland had some of the East's highest levels of fine particulate matter. Reductions of NO_x and Sulfur Dioxide (SO_2) resulting from Maryland's Healthy Air Act (see page 4), the use of natural gas as a fuel and other programs are contributing to lower levels of fine particles. Clean diesel technology and a partnership with the Port of Baltimore are reducing fine particle emissions from heavy duty vehicles and equipment.



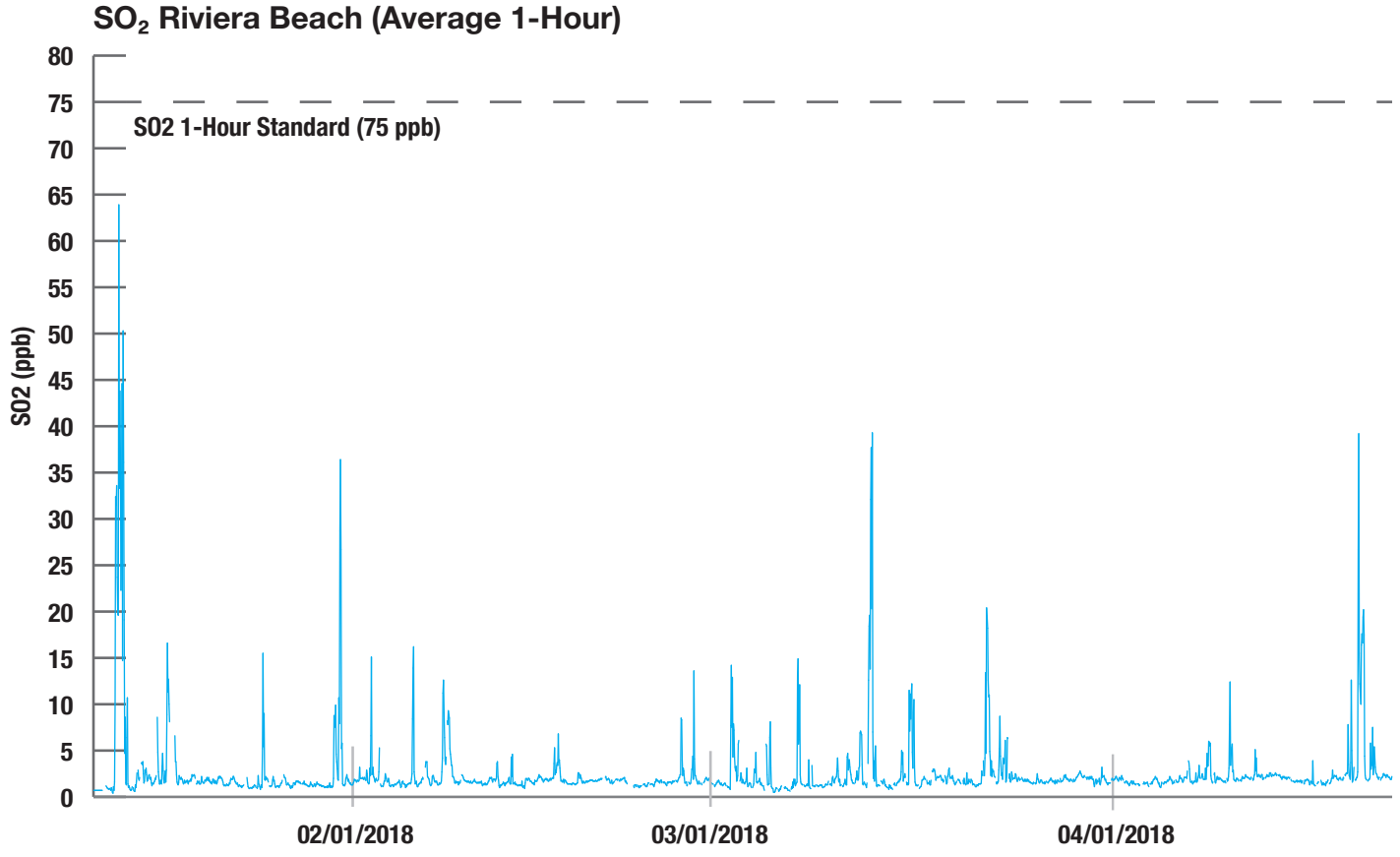
Sulfur Dioxide

SO_2 pollution has also been reduced dramatically over the past 10 years. This progress is driven by the Healthy Air Act and is also related to fuel switching from coal to natural gas by power plants and large industrial sources and regulations requiring the use of low sulfur fuels for home heating and heavy engines.

Maryland is preparing for a new round of SO_2 reductions to comply with recently revised federal standards for SO_2. Unlike ozone and particle pollution which involve hundreds of contributing sources across airsheds that stretch for hundreds of miles, SO_2 emissions have greater impact in smaller areas where power plants and large industrial sources are located.

On June 30, 2016, the EPA designated portions of Maryland's Anne Arundel County and Baltimore County as non-attainment for the 2010 1-hour SO_2 National Ambient Air Quality Standard. Portions of Western Maryland and the D.C. Metropolitan Area have also been identified by EPA as needing to submit plans to address SO_2 emissions. Maryland is working with the EPA and local communities to develop a plan to address SO_2 emissions in these areas. The plan for Anne Arundel County and Baltimore County must be addressed first as a plan is due to the EPA in 2018, and must show that air quality issues will be resolved by 2021. The main sources of SO_2 in this area are the Brandon Shores, Herbert A. Wagner and C.P. Crane power plants.

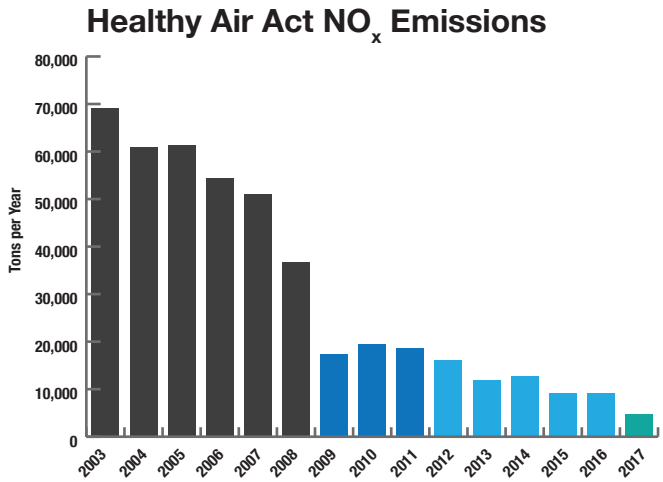
The Brandon Shores plant installed state-of-the-art SO_2 controls in 2009. The Wagner and C.P. Crane plants installed new controls in 2015 and 2016 to further reduce SO_2 emissions. These controls include the use of lower sulfur fuel and a dry sorbent injection system. Several coal-fired units are also scheduled for retirement between 2018 and 2020, which will further reduce SO_2 emissions. Air quality modeling shows that SO_2 levels, with these new controls in place, are protective of public health. In order to better evaluate actual ambient SO_2 concentrations in the area, a source-oriented SO_2 monitor was established at Riviera Beach Elementary School in January, 2018. The chart below summarizess data gathered to date which has all been below the standard.

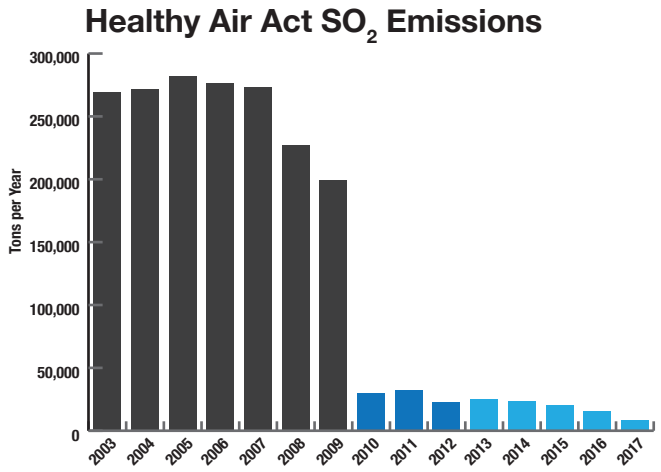


Maryland continues to develop and implement new programs to ensure that the progress that has been made in cleaning the air continues into the future. Three of the cornerstone programs from the past that have driven the progress are the Healthy Air Act of 2006, the Clean Car Act of 2007 and the 2015 NO_x regulation for coal-fired power plants. New 2016-2017 initiatives to help continue the progress towards clean air include the updated Clean Cars Act of 2017, new greenhouse gas emission reduction initiatives, and the Maryland petition to EPA that highlights 36 upwind power plant units that significantly affect Maryland's air quality.

Reducing Emissions from Power Plants

Maryland has seen dramatic NO_x, SO_2, greenhouse gas, mercury and other emission reductions from Maryland power plants due to the 2006 Healthy Air Act, which was the largest emission-reducing initiative ever implemented in Maryland, and the 2015 NO_x regulation. The 2015 NO_x regulation requires units to minimize NO_x emissions every day of the ozone season by optimizing and running pollution control equipment and by lowering emission rates to achieve increasingly stringent standards by 2020. Since this rule was implemented in 2015, Maryland's coal-fired power plants have recorded the lowest NO_x emissions ever.





In 2017, Maryland issued the first annual report card for the performance of coal-fired power plants across the eastern United States. The report card covers 323 coal-fired Electric Generating Units (EGUs) that have already installed advanced NO_x control technology, yet they do not always use the technology effectively. This is especially important during the summer months when NO_x can combine with sunlight and heat to form ground-level ozone or smog. Research shows that ozone is often transported - by westerly and southerly winds - into Maryland from upwind states at levels that are already approaching the 70 parts per billion ozone standard. MDE analysis examined what could be achieved if other states followed requirements that are similar to the 2015 NO_x regulation mentioned above.

MDE's analysis demonstrates that by running pollution controls effectively throughout the 2017 ozone season (May-September) up to 400 tons of NO_x emissions per day could have been reduced. This equates to over 46,000 tons of NO_x emissions reductions that could have been reduced over the 153-day ozone season. For more information on MDE's Annual Report Card for Coal-fired Power Plants visit http://mde.maryland.gov/programs/Air/Pages/OzoneSeasonPerformance.aspx

In September 2017, Governor Larry Hogan directed Maryland Attorney General Brian Frosh to file suit against the EPA for its failure to act on a petition requiring power plants in five upwind states to reduce pollution that significantly affects the quality of the air that Marylanders breathe. The petition asks the EPA to require certain power plant units in the upwind states of Indiana, Kentucky, Ohio, Pennsylvania and West Virginia to run their air pollution controls to reduce emissions. The 36 units identified in the suit have already purchased state-of- the-art NO_x controls, but they are no longer running those controls effectively.

"The Maryland Department of the Environment has been working with upwind states to reduce smog that threatens our citizens, communities, and the Chesapeake Bay, but we now need the EPA to step in to ensure the good neighbor provisions of the federal Clean Air Act are fully realized,"
Maryland Secretary of the Environment Ben Grumbles.

Clean Cars

The Clean Cars Act of 2007 helped to dramatically reduce NO_x and greenhouse gas emissions by requiring that vehicles purchased in Maryland be the lowest emitting vehicles allowed by law. This law has also played a major role in helping the State to lower ozone and fine particulate levels and meet climate change goals.

The Clean Cars Act of 2017 extends and increases incentives for buying plug-in electric vehicles and providing the supporting infrastructure. This law will provide tax incentives through 2020 to encourage consumers to purchase electric vehicles. The State, working through the Electric Vehicle Infrastructure Council (EVIC) and the Electric Vehicle Infrastructure Program (EVIP), has also begun to invest in the infrastructure needed to ensure that consumers can easily charge their electric vehicles. Maryland is one of the leaders in the East in installing electric vehicle infrastructure, including new "fast chargers" that dramatically reduce the time needed to get an "EV Fill Up."

In April 2018, Governor Larry Hogan called upon federal environmental regulators to drop plans to weaken vehicle emissions standards. The Hogan administration urged the EPA to leave the current greenhouse gas emissions standards for light-duty vehicles in place and to allow states like Maryland to continue to adopt vehicle emissions standards that are more protective than federal standards.

As part of federal settlements in 2017 with automaker Volkswagen for installing devices that allowed vehicles to exceed emissions standards and pollute the state's air, Maryland is eligible to receive approximately $76 million dollars from an environmental mitigation trust fund. This money is expected to dramatically enhance the State's efforts on Electric Vehicles and help Maryland with efforts to reduce emissions from diesel vehicles and other NO_x sources. In a partnership between the Port of Baltimore, the Maryland Department of the Environment and the Maryland Department of Transportation, more than $1 million has already been invested in clean diesel projects at the Port of Baltimore, with an additional $1 million worth of new projects designed to reduce diesel emissions underway.

More recently, in April 2018, Maryland announced a new $33.5 million State settlement with Volkswagen and its affiliates, Audi and Porsche. Under the terms of the agreement, Volkswagen, Audi and Porsche agreed to:

- Pay a $29 million civil penalty.
- Select a Maryland-based port facility to provide certain logistical and other support to Volkswagen valued at $4.5 million in benefit.
- Increase the availability of zero emission vehicles (ZEVs) in Maryland by introducing three additional battery electric vehicle models in Maryland; including the currently available e-Golf or its successor or replacement models through 2019.

"This enforcement settlement shows polluters will pay a stiff price for breaking the laws that protect the air Marylanders breathe. The Hogan administration is committed to clean cars and a clean and healthy environment."
Maryland Secretary of the Environment Ben Grumbles.

Reducing Greenhouse Gas Emissions

Maryland's Greenhouse Gas Emission Reduction Act of 2016 renewed and strengthened our commitments to address climate change. This law requires the State to develop and implement a plan to reduce greenhouse gas emissions by 40 percent by 2030. Greenhouse gas emissions are linked to climate change and sea level rise, and Maryland is highly vulnerable to floods and rising water. This law builds from the 2006 law that required a 25 percent reduction in greenhouse gas emissions by 2020, which Maryland is on track to achieve.

Along with the Greenhouse Gas Emission Reduction Act of 2016 and the Clean Cars Act of 2017, Maryland is working on other initiatives to reduce climate change pollutants. In December of 2017, Maryland, in coordination with the bipartisan, nine-state Regional Greenhouse Gas Initiative (RGGI) collaborative, announced updates to the RGGI Model Rule. RGGI is a regional cap and invest program focused on reducing carbon dioxide (CO_2) emissions from power plants and strategically investing revenues into energy and environmental programs. The amendments to RGGI will result in a 30 percent reduction in the regional cap from 2020 to 2030.

On January 10, 2018, Governor Larry Hogan committed Maryland to participate in the U.S. Climate Alliance, a bipartisan coalition of governors committed to reducing greenhouse gas emissions consistent with the goals of the Paris Agreement. Maryland's climate standards and goals have been significantly stronger than the Paris climate accord. Maryland will use this opportunity to encourage all states to adopt clean air standards and greenhouse gas goals as strong and as aggressive as Maryland's.

Maryland is also engaged in other important partnerships such as the Transportation and Climate Initiative and the Climate Registry. The Hogan Administration is committed to bipartisan solutions that protect the environment and provide affordable, reliable and sustainable energy to Maryland citizens and communities. For more information see the Maryland Commission on Climate Change website: http://mde.maryland.gov/programs/Air/ClimateChange/MCCC/Pages/index.aspx

Clean Air Resources

Air and Radiation Administration: http://mde.maryland.gov/programs/Air/Pages/index.aspx

Air Monitoring Program:
http://mde.maryland.gov/programs/Air/AirQualityMonitoring/Pages/index.aspx

Maryland Clean Cars Program:
http://mde.maryland.gov/programs/Air/MobileSources/Pages/CleanCars.aspx

Maryland Commission on Climate Change:
http://mde.maryland.gov/programs/Air/ClimateChange/MCCC/Pages/index.aspx

Maryland Volkswagen Mitigation Plan:
http://mde.maryland.gov/programs/Air/MobileSources/Pages/MarylandVolkswagenMitigationPlan.aspx